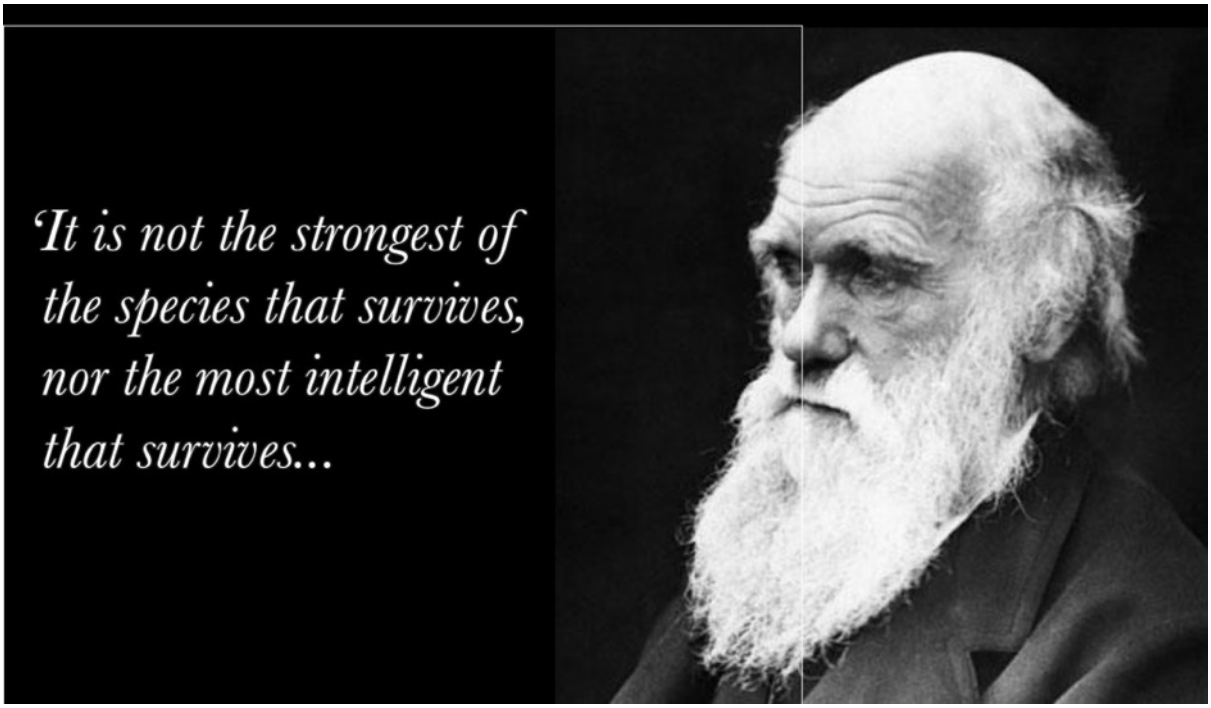
[Note to reader: word used in images have been deducted from the word count]

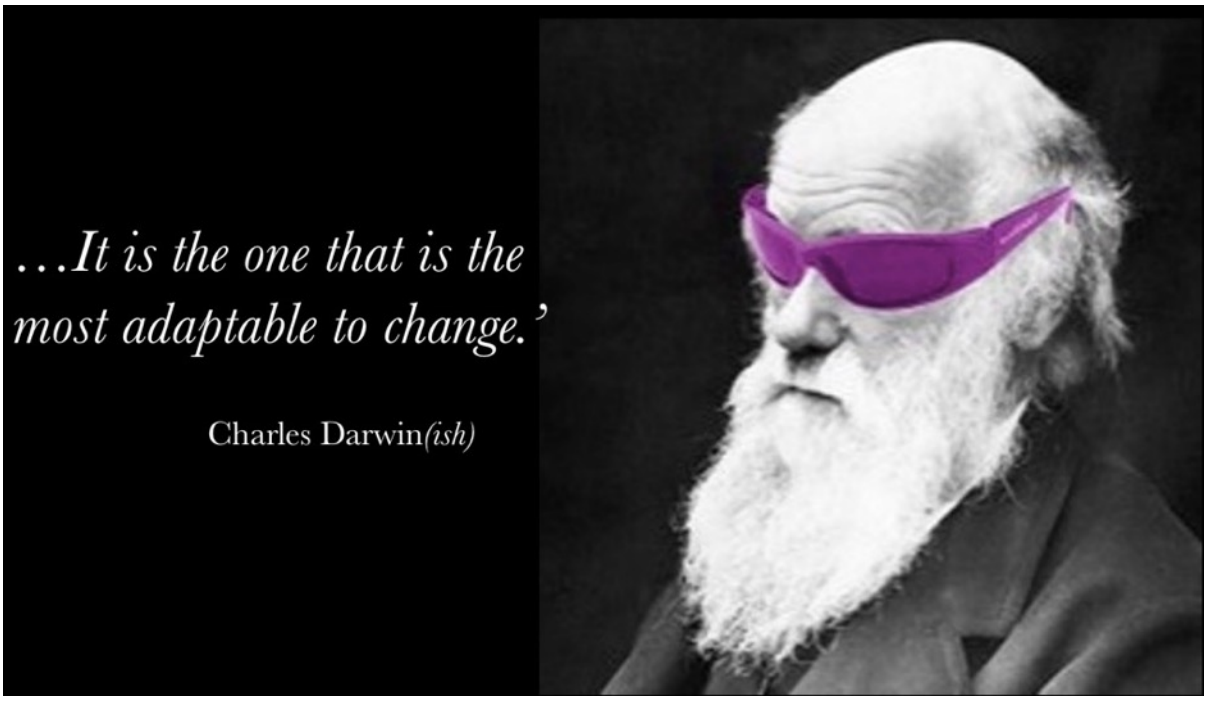
The Last Baton Pass

Evolving a Recipe for a Renewed Social Compact between Young & Old

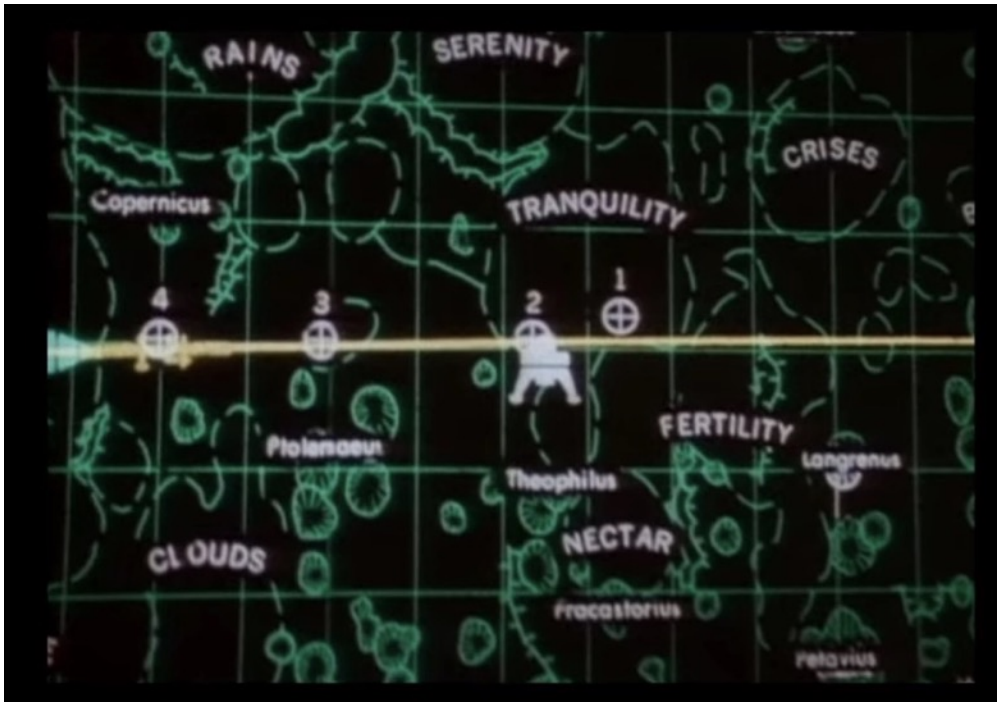
"Youth and age are comparative expressions; and an oak of a certain age may be called young, while a contemporary shrub is already on the verge of its decay."

William Herschel (1789)[1]





"Ah, Houston? We have a problem."



Mission Control map, Apollo 11 Moon Landing Zone: 'Tranquility', near 'Crises' and 'Fertility'.

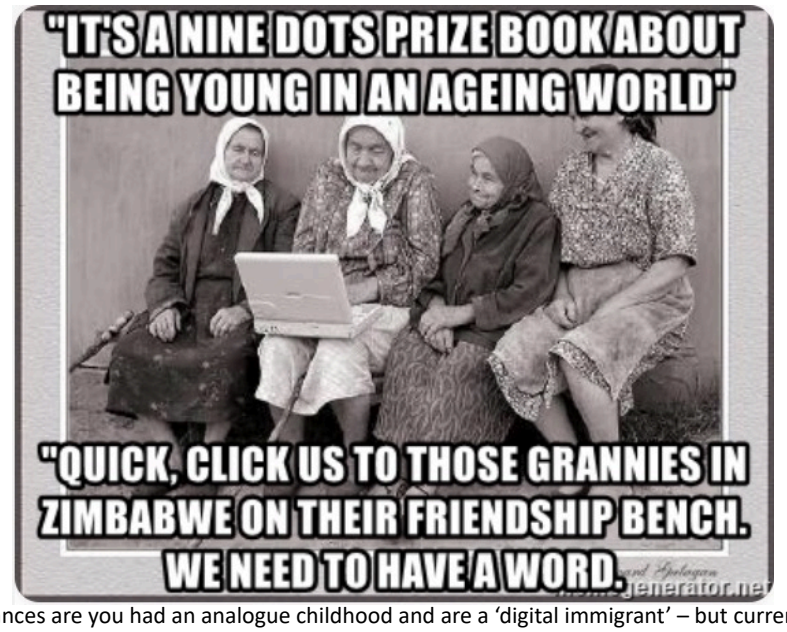
"Some people are marching together and some on their own | Quite alone | Others are running
The smaller ones crawl | But some sit in silence | They're just older children | That's all | After all"

David Bowie (1970)[3]

Spaceship Earth[4] took until around 1800 – 99% of human history – to acquire its billionth crew member. Today, she[5] carries almost eight billion[6] souls, many of whom are more passenger than crew: in the next 35 years, a billion old people will be added to the 700 million currently aboard. In 80 years, roughly a lifetime, half a billion will be what renowned demographer and economist David E. Bloom calls "the 85+ crowd"[7]: the 'old old', a bankruptingly expensive group to look after. This is the young's ageing world, a world few of them know about, let alone grasp.[8] That needs to change, if only to make sure the young, forged in the Fourth Industrial Revolution, don't drop the baton for the home straight of this, the greatest relay race of humankind's history – just when the finishing line is in sight.

For somewhere around the end of this century, Spaceship Earth achieves her full human payload[9] – our full complement; the task is to get there in one piece. Our immense collective, cumulative achievement getting here, creating a populous, albeit ageing, world, brings serious problems. Solving them requires a rare blend of *technical ingenuity* and *social ingenuity*[10], digital *and* analogue, East *and* West, North *and* South (Africa's population will grow by 'two Chinas' this century[11]). Our last great work then, whether Baby Boomers or Generation X, is to successfully pass the baton to the 'anchor leg' – the youngest, fastest generations we have on the team, the so-called Millennials and Generation Z – who will have to run this final stretch (and who will themselves be some version of aged by the time they're done). Together, we need to actively *co-create* that baton pass, or there may be trouble ahead – so let's face the music, and dance.[12]

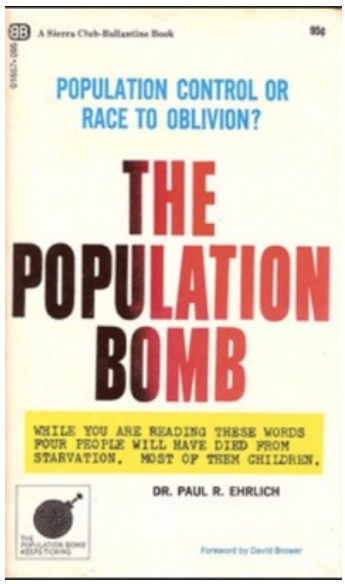
Plotting


"IT'S A NINE DOTS PRIZE BOOK ABOUT BEING YOUNG IN AN AGEING WORLD"
"QUICK, CLICK US TO THOSE GRANNIES IN ZIMBABWE ON THEIR FRIENDSHIP BENCH. WE NEED TO HAVE A WORD.

If you're reading this, chances are you had an analogue childhood and are a 'digital immigrant' – but current young (and all future) generations are 'digital natives'.[13] Today you're lucky if the young read your meme, let alone your book[14] or essay.
(See below for more on Zimbabwe's 'Friendship Bench' Project)

"You campaign in poetry. You govern in prose."
Governor Mario Cuomo

A thought experiment by David E. Bloom[15]: imagine a pair of entwined planets – Planet A, broadly Young (and Digital); and Planet B, broadly Old (and Analogue). Imagine telling a 15-year-old they will soon be relocated to Planet B – where their vivid youth will get them attention and confer considerable joy. What might such young planetary pioneers want in return? What do they need or lack that the old have – and vice versa? And how can we help accelerate the 'social business' at hand in this 'social capitalism': the mutual flow of human capital, from culture to care, for broad and mutually rewarding benefit?[16]


A Sierra Club-Ballantine Book
POPULATION CONTROL OR RACE TO OBLIVION?
THE POPULATION BOMB
WHILE YOU ARE READING THESE WORDS FOUR PEOPLE WILL HAVE DIED FROM STARVATION. MOST OF THEM CHILDREN.
DR. PAUL R. EHRLICH

For decades demographers and economists have created a substantial body of policy analysis and prescriptions about the *scale* of this task. Yet it was biologist Paul Ehrlich's media savvy that helped his alarmist[17] *The Population Bomb* catch the public's imagination in 1968. Fast forward half a century, to just last week, and Ehrlich's latest report warns of 'ghastly mass extinction'. "Growthmania is the fatal disease of civilisation", he says, "it must be replaced by campaigns that make equity and well-being society's goals – not consuming more junk."[18] He's broadly right, but of six basic plots extracted from a computer analysis of 1737 stories, inspired by Kurt Vonnegut's rejected thesis on 'deep narrative shapes', Ehrlich clearly leans to 'tragedy' ('riches-to-rags') and 'Icarus'.[19] But, as with *Peter and the Wolf*, one problem is that, as doom-laden predictions accumulate in a social media world, they can, paradoxically, *disempower* at best, and cause depression and worse at worst. Rising reported levels of mental health issues among the young suggest bleaker worldviews, informed by economic, social, environmental and other stresses, are taking their toll. We need a better story.

Evolving diverse solutions

…though not one individual of the many may himself be fit for the supreme power, yet when these many are joined together, it does not follow but they may be better qualified for it than those; and this not separately, but as a collective body; as the public suppers exceed those which are given at one person's private expense: for, as they are many, each person brings in his share of virtue and wisdom; and thus, coming together, they are like one man made up of a multitude, with many feet, many hands, and many intelligences: thus is it with respect to the manners and understandings of the multitude taken together...'

Aristotle
Politics: A Treatise on Government, Book III, Chapter XI[20]

1st-2nd century papyrus scrap of Aristotle's *Politics*

"In difference lies possibility."
Scott E Page

Monocultures had a good run in the 20th century. Most political and business leaders looked, dressed and sounded the same. Big organisations like IBM, Ford, Governments and Universities faced little real competition. Barriers to entry were high. Knowledge and news were scarce, so powerful media barons held sway. (Newsrooms, printing plants, studios and the like were expensive). A small pool of talent did rather well, thank you very much. In a relatively stable world, there was little pressure to change. But as with agriculture, monocultures, lacking diversity, are vulnerable to new diseases: the last work of the great Norman Borlaug focussed on a re-emergence of a new variant – Ug99 – of the wheat blight his Nobel Prize-winning work had bested, and he found himself, in his nineties, one of the few who recalled what that *felt like* in the Great Depression he had personally experienced.[21] And unlike Ehrlich, his plots soared. (He also took great delight, with a little help on the tech front, in scrapping with young undergraduates who were convinced he was 'wrong'.[22] He drily noted that "Producing food for 6.2 billion people…is not simple," adding, "[Organic approaches] can only feed four billion–I don't see two billion volunteers to disappear.")

The monocultural world was thus ill-prepared when the cultural and digital revolutions arrived, arm in arm. As the costs of communication fell, and other embedded historical costs got stripped out, it became apparent that a real complex problem-solving asset lay in *diverse groups* of talented people. Diversity had been crowded out as monocultures selected for – and then amplified the presence of – 'familiar' types. But diversity didn't go away. It can't. Because variety is the very engine of change and, especially, of adaptation.

Evolution's core algorithm – 'vary'; 'select'; 'amplify'; 'rinse & repeat' – starts with diversity, selects what works, scales it, and the beat goes on: it *relies* on keeping that variation coming. (It also describes the Nine Dots Prize process.) In diversity, as complexity scientist Scott Page demonstrated *mathematically* ("So this is, like, *true*", as he jokes[23]) lies the *best* chance we have to reduce 'crowd error'.

Yet our institutional landscape, born in the mid-20th century, "getting on a bit", its 'firmware' struggling to run the agile digital 21st century, isn't wired for real diversity – of background, experience, thinking, age, variety of all kinds. That has to change.

Given the degree to which the "diversity agenda" has so often been often unhelpfully politicised, it's perhaps unsurprising that some of the most interesting work on the subject quietly happens elsewhere, among scientists and technologists for whom diversity is simply an interesting 'property'. To a telecommunications engineer, a diversity scheme is not about being 'trained' in a room: it's a way to improve a signal's reliability (and so reduce fading) by using two or more communication channels with different characteristics.[24] To a biologist, diversity is a crucial measure of the health of an ecosystem. To an agronomist, diversity is the way to reduce monoculture's susceptibility to disease. (Highly relevant is you want to avoid famines or enjoy a reliable cup of coffee). To an historian, the reduction in knowledge-diversity created by Spain's 1492 expulsion of the Jews is one explanation of Spain's failure to capitalize on the enormous wealth it was shortly to acquire in the New World (Columbus returned from the Americas that very year). There's a lot of variance in diversity.

For engineer, sociologist and lifelong fan of Broadway musicals Brian Uzzi,[25] diversity offers a lens to look at successful teams. Together with Luis Nunes Amaral, Roger Guimerà and Jarrett Spiro, whose diverse and multidisciplinary backgrounds include chemical and biological engineering, sociology and organisational behaviour, he looked at what makes for a Broadway success. And it's not catchy songs.

Uzzi took a data set of all the Broadway musicals that opened between 1945 and 1989 (321 of them) and looked closely at whether the top team – producers, director, choreographers and writers – had worked together before:

> After crunching the statistics, he discovered something remarkable. Teams who had never worked together, perhaps unsurprisingly, fared poorly: their "weak" networks meant a lack of creative vision, and lots of duds. And at the other extreme, teams that had worked together successfully also tended to produce flops… *Groups with exactly the right mix of new and old participants reliably produced hits*. [Emphasis added] This variation in the "density" of the ties allowed easy communication and fostered greater creativity – new ideas from the outsiders meshed with the experience of the insiders. It didn't matter if a musical was about cats or roller-skating trains, or who starred in it. Its success came down to the structure of the network binding its team together. The same thing has been found to be true of scientific invention or business innovation. [26]

So, there you have it: 'dream teams' need diversity – but different types (and ages) of diversity.

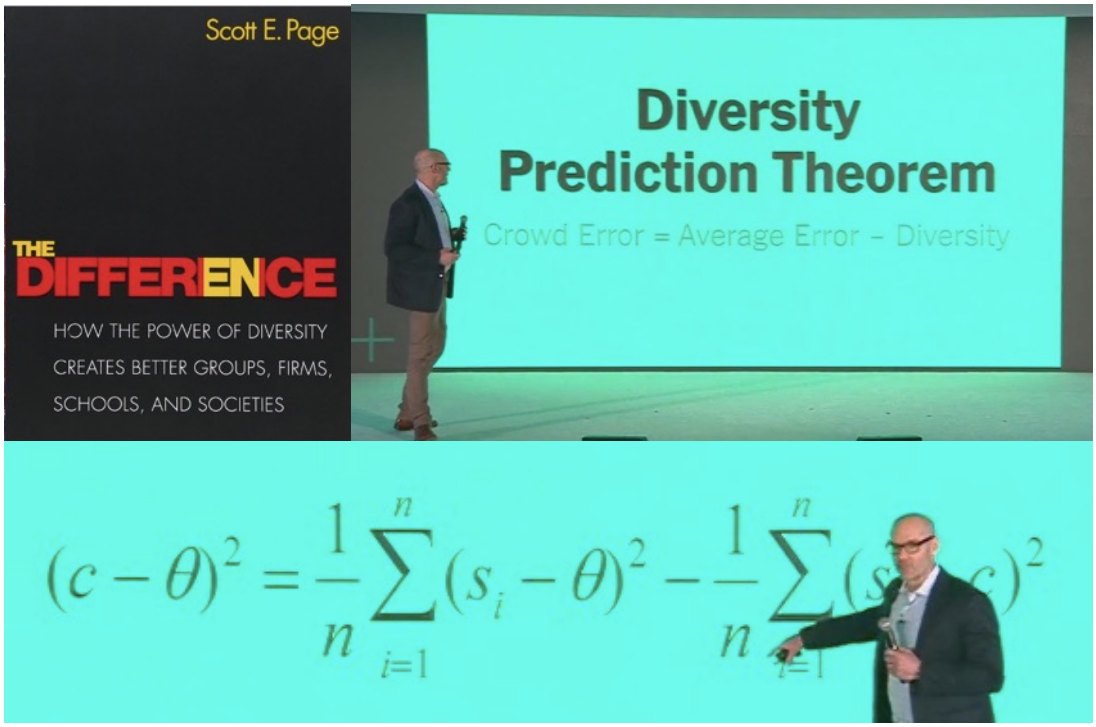
Realistically – and post-pandemic economics may insist upon it – institutions must start 'letting go' of habitual bureaucratic habits (which 'select and amplify' but rarely 'rinse and repeat' the 'vary' element) in order to start 'getting go'. Covid may allow renewed agility.

Because as Camilla Cavendish, David Cameron's former Policy Director, notes in her recent (pre-pandemic) book, *Extra Time: 10 Lessons for an Ageing World,*[27] "The [current] social contract is being stretched to breaking point by the changing ratio of old to young, the increasing share of wealth owned by older generations and poor job prospects for the young." She adds, soberingly:

> "We are not ready. We are used to thinking of 'old' as 60, of early retirement as desirable, of dementia as inevitable, of good ideas and energy coming only from the 'young'. In fact, we

> don't like thinking about growing old at all, so we haven't noticed that 'old' is being redefined. We haven't even fully realised how long we might have to live–or planned for it."

Some politicians have attempted some of the well-attested remedies economists and policymakers proffered for decades – raising retirement ages and shifting to insurance-based healthcare, for example – but timidly, too late: they're wary of increasingly influential 'grey voters' who resent changes to generous benefits they feel entitled to, but don't understand have been outstripped by longevity.[28]


Scott E. Page
THE DIFFERENCE
HOW THE POWER OF DIVERSITY CREATES BETTER GROUPS, FIRMS, SCHOOLS, AND SOCIETIES
Diversity Prediction Theorem
Crowd Error = Average Error – Diversity
$(c-\theta)^2 = \frac{1}{n}\sum_{i=1}^{n}(s_i-\theta)^2 - \frac{1}{n}\sum_{i=1}^{n}(s$

Just one example: declines in the working-age population ratio since 1950 account for 57% of the decline in the average annual GDP growth rate.[29] We need to deliver – and politically 'sell' – radically imaginative remedies, and soon. Frankly, we're out of time – and resources dwindled alarmingly in the last year alone, all those future plans spent on present pandemic. In a trade-off tripod of 'time', 'resources' and 'creativity', the latter packs the punch.

That's a problem for policymakers. Creative solutions, being untried, are definitionally risky; but other risks are afoot, as Cavendish notes: "Shrinking populations will soon alter the balance of power between countries, and change the politics of immigration." Coronavirus may offer a rare chance to reconfigure systems and build on creative solutions that exist elsewhere, usually trying to grow outside failing mainstream 'care' systems. Covid has already upped the tempo of the dance between digital and analogue, in telemedicine, for example. But as William Gibson remarked[30], "the future is already here – it's just not very evenly distributed." We can glimpse some such future 'desire paths'[31] in Japan, the 'oldest' country[32], in robots substituting for human care.[33] (Other futures are available).

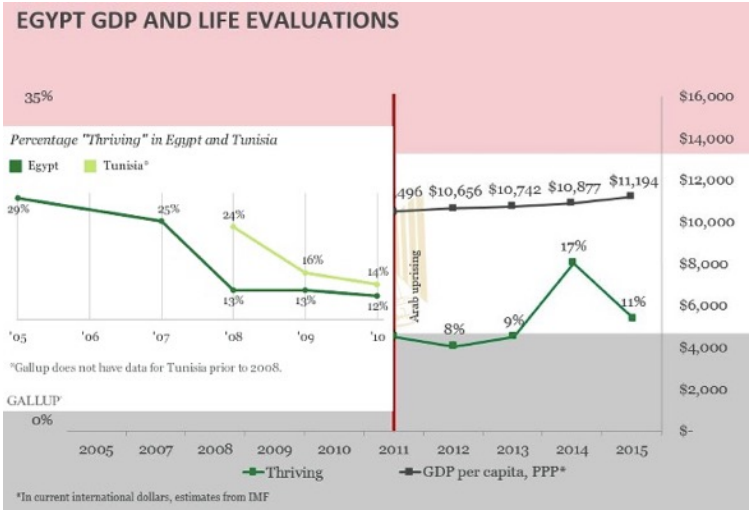
The basic ingredients[34] are well understood by demographers, economists, policymakers and politicians; we have much of the recipe; now we must break a few eggs – not for an omelette but to bind the ingredients – from housing and infrastructure to valuing care properly and sharing cultural capital before it's too late.

We must also generate, and rapidly scale, more *social ingenuity*[35] (and less institutional sclerosis). And we need an overarching narrative – which includes extant ones like climate change, biodiversity, sustainability, and so forth – to bring *meaning* to the task, a concept captured well in Japanese and highlighted by Cavendish: *Ikigai* (Figure, right)

Such ingenuity is to be found far from Whitehall, the Beltway or other capitals – in fact, it's usually been generated in direct response to the failures of current institutional systems. For example, the Netherlands is pioneering deeply human community care[36] that's much less expensive than government services – but relies on power and agency flowing *towards* the 'point of care' (and share) and *away* from entrenched bureaucratic interests.[37]

One of six Dutch university students renting a room in the *Humanitas* care home in exchange for 30 hours a month of activity, with some of the residents (and now friends).

Hope – all Pandora had left in her jar – lies in *thriving*. Its absence is, in human terms, awful. Politically, it's incredibly dangerous, too, as the Arab Uprising showed when 'thriving' fell off a cliff[38]:



We must love one another and die[39]

Dozens of Zimbabwean grandmothers – formerly paid, now volunteering – sit daily on 'friendship benches', offering free wisdom, perspective, and (trained) therapy to the worried young[40]. Technology means that such under-utilised resources could be shared globally (I imagine they'd have some choice words for London gang members, for instance).
www.friendshipbenchzimbabwe.org

'Such fierce alarums both of hope and fear'
William Shakespeare

Today's young hear a lot about climate change – today's presiding alarum[41] – to which governments and corporations increasingly dedicate considerable resources. Yet if teachers wrangle 'the environment' into too many lesson plans, as they do, young people can become allergic to it.[42] Climate change is, furthermore, somewhat abstract – a strong hypothesis, with a growing body of compelling evidence, but generally lacking the immediacy, character and depth of real story. (Meanwhile sudden, fearful pandemic restrictions, like drastically curtailed travel, consumption, and human *reach,* may show 'Zero Carbon' sacrifices as less appealing – even though many such

restrictions are, in fact, simply longstanding realities for our aged.)

Yet as we jettison the 20th century burners that got us here, we're increasingly aware that happiness is worth investing in, sacrificing for, and – perhaps, post-lockdowns – to be found closer to home and in simpler ways. Harvard economist Maddalena Ferranna reports a growing body of research showing the health doesn't just lead to happiness, but vice versa, and the economic impacts are non-trivial.[43]

The middle generation has done the work. "We know what needs doing, and have about 14 to 20 years to get it right", says technology investor and renowned editor Jason Pontin[44]. "If we don't, we honestly don't know what happens next. For example, the periodicity of dangerous emerging zoonotic diseases is down to about 8 years – we dodged the bullet for the last two."

In short, we need to 'live in fragments no longer' and 'only connect"[45] – both young and old – with a new variety of spiced policy menus, centred in *ikigai*-like meaning, including utilising the technology already in so many people's hands, and *reinvent* the task from 'caring for' to 'sharing with'. We can skilfully reconfigure the already disintermediated, and dispersed, traditional extended family, add in friends to the mix, and capture the real benefits – from baby-sitting, war stories and recipes to analogue skills and insights. Benefits – like walking the earth when in doubt[46] – that the digital simply can't reproduce.

Coronavirus is cutting a staggering swathe through our old, and we will have to come to terms with that. But meanwhile, we need to turn to Christopher Booker's quixotic but interesting seventh basic plot: The Quest. Our quest is also a race against time – because the last analogues are leaving us. And before they go, we need the young to help get them online and capture their living archive, and to ensure, as Aaron Sorkin wrote in a famous West Wing scene, that "no one gets left behind."[47]

"We can't solve problems by using the same kind of thinking we used when we created them."

Albert Einstein

Child with speech difficulties
School entrance exam failure
Unemployed teacher
Patent clerk
Emigré
Jew
Bicyclist
Physicist

Nobel Prize winner
Refrigerator inventor

[1] *'Catalogue Of A Second Thousand Of New Nebulæ And Clusters Of Stars: With A Few Introductory Remarks On The Construction Of The Heavens'*, William Herschel [Read at the Royal Society, June 11, 1789]

[2] Variations on this pithy, if rather too perfect, take on evolution are widely misattributed to Darwin (https://quoteinvestigator.com/tag/leon-c-megginson) – notably, in pre-internet 'quote investigator' days, by John E Stallworth, at a 1987 Congressional Hearing before the Select Committee on Aging (House of Representatives, One Hundredth Congress, First Session), *Improving the Quality of Life for the Black Elderly: Challenges and Opportunities*, Hearing date: September 25, 1987, Start Page 27, Quote Page 28, U.S. Government Printing Office, Washington, D.C. https://babel.hathitrust.org/cgi/pt?id=pst.000013390877&view=1up&seq=32

[3] 'After All', *The Man Who Sold The World*, 1970 (Lyrics & Performed by David Bowie)

[4] *Operating Manual for Spaceship Earth*, Buckminster Fuller (1969)

[5] With the greatest respect to the Lloyd's Shipping Register, as the Captain of a 1934 wooden vessel – she saw war service and still has great cheekbones – I come down on the side of the Royal Navy with regard to referring to boats as female: https://www.telegraph.co.uk/news/uknews/1388373/Lloyds-List-sinks-the-tradition-of-calling-ships-she.html

[6] 'The world population was 3 billion in 1960; it reached 6 billion around 2000, and the United Nations projects it will surpass 9 billion by 2037. The population growth rate has been slowing, however, from peak annual rates in excess of 2 percent in the late 1960s, to about 1 percent currently, to half that by 2050… Between 1970 and 2020, the fertility rate declined in every country in the world…Population aging is the dominant demographic trend of the twenty-first century.' (David E. Bloom, *Population 2020: Demographics can be a potent driver of the pace and process of economic development.* Finance & Development, March 2020)

[7] *The what, so what, and now what of population ageing,* David E. Bloom, in *Live Long and Prosper? The Economics of Ageing Populations* (April 2019, a VoxEU.org book, CEPR Press), Edited by David E. Bloom. (Full disclosure: I have worked with David in the past, and greatly admire him, and his impeccable work, and therefore tend to cite him heavily).

8 The top 10 concerns of British youth in a recent survey: 1) Lack of employment opportunities, 2) Failure to succeed in education system, 3) Issues related to body image, 4) Family problems, 5) Substance abuse, 6) Pressures of materialism, 7) Lack of affordable housing 8) Negative stereotyping, 9) Pressures of 24-hour social networking, 10) Crime https://www.allaboutschoolleavers.co.uk/news/article/318/the-top-10-challenges-facing-young-people-today

[9] That is, when Earth's population is expected to reach its peak and population growth become near zero. (A 2019 UN estimate puts it at 10.9 billion in 2100 (https://population.un.org/wpp/Download/Standard/Population/), although other estimates vary, with Global Burden of Disease Study researchers estimating a 1064 peak at 9.7 billion, declining to 8.8 billion in 2100 (*Fertility, mortality, migration, and population scenarios for 195 countries and territories from 2017 to 2100: a forecasting analysis for the Global Burden of Disease Study*, Vollset et. al., *The Lancet*, Vol. 396, Issue 10258, October 17, 2020)

[10] A distinction outlined in Andrew J. Scott and Lynda Gratton's *The New Long Life: A Framework for Flourishing in a Changing World* (May 2020), where they note the two are rarely in lockstep, and that our current levels of technical ingenuity are ahead of our social ingenuity, as well as causing anxieties and problems of their own (e.g. AI, virus research labs, inequality, social media &c.)

[11] 'Africa's population will rise by 3.2 billion, or over two Chinas, by the century's end.' Laurence J Kotlikoff (2019), *Aging in Global Perspective*, in David E. Bloom et al, *Live Long and Prosper?*, Op. Cit.

[12] *Let's Face the Music and Dance*, Irving Berlin (1936) https://www.youtube.com/watch?v=gACCCmFKP80

[13] Marc Prensky (2001), 'Digital Natives, Digital Immigrants' From *On the Horizon* (NCB University Press,Vol. 9 No. 5, October 2001)

[14] American research found '12th graders who read a book or a magazine every day declined from 60% in the late 1970s to 16% by 2016, and 8th graders spent almost an hour less time watching TV in 2016 compared with the early 1990s. Trends were fairly uniform across gender, race/ethnicity, and socioeconomic status. The rapid adoption of digital media since the 2000s has displaced the consumption of legacy media.' *Trends in U.S. Adolescents' Media Use, 1976–2016: The Rise of Digital Media, the Decline of TV, and the (Near) Demise of Print,* Jean M. Twenge, Gabrielle N. Martin, and Brian H. Spitzberg, (APA: Psychology of Popular Media Culture, 2019, Vol. 8, No. 4, 329–345 https://www.apa.org/pubs/journals/releases/ppm-ppm0000203.pdf) A British survey found 'respondents who read least frequently are more likely to be male, aged under 30, have lower levels of qualifications and have lower levels of happiness and satisfaction with their lives. Amongst both women and men, the over 60s read most and the 18 to 30s read least. This difference is most prominent for females: only 18% of women under 30 read every day, compared with nearly half (48%) of women over 60.' *Book Trust Reading Habits Survey* (2013) https://www.booktrust.org.uk/globalassets/resources/research/1576-booktrust-reading-habits-report-final.pdf. Global smartphone penetration shows little sign of slowing. Pew estimate 5 billion people have such devices, and note uptake is more rapid among the young. Although richer economies lead the way, others are catching up fast, with a group of emerging economies at a median 45%, (e.g. South Africa & Brazil 60%; Nigeria, Kenya and Indonesia ~40%) https://www.pewresearch.org/global/2019/02/05/smartphone-ownership-is-growing-rapidly-around-the-world-but-not-always-equally/

[15] Pers. Comm., Zoom meeting (16 January, 2021).

[16] *Social Capitalism and Human Diversity,* David E Bloom and River Path Associates, 2000 (Chapter in *The Creative Society of the 21st Century*, Future Studies Series, OECD) https://www.oecd.org/futures/35391171.pdf#G5.1004637

[17] The paperback has proud reviews about "breeding recklessly", while the famous opening lines – "The battle to feed all of humanity is over. In the 1970s and 1980s hundreds of millions of people will starve to death in spite of any crash programs embarked upon now" was entirely wrong: Norman Borlaug's extraordinary ingenuity changed food globally. The opening lines were shortly followed by a passage that now reads as, at best, naïve, and at worst rather, er, 'problematic':

"I have understood the population explosion intellectually for a long time. I came to understand it emotionally one stinking hot night in Delhi a few years ago. My wife and daughter and I were returning to our hotel in an ancient taxi. The seats were hopping with fleas. The only functional gear was third. As we crawled through the city, we entered a crowded slum area. The temperature was well over 100, and the air was a haze of dust and smoke. The streets seemed alive with people. People eating, people washing, people sleeping. People visiting, arguing, and screaming. People thrusting their hands through the taxi window, begging. People defecating and urinating. People clinging to buses. People herding animals. People, people, people, people. As we moved slowly through the mob, hand horn squawking, the dust, noise, heat and cooking fires gave the scene a hellish aspect. Would we ever get to our hotel? All three of us were, frankly, frightened… since that night I've known the feel of overpopulation."

Ehrlich's book was published in 1968, the year in which the *rate* of growth of world population had already started its decline – and the same year that Norman Borlaug's remarkable work, for which he received a Nobel Prize in 1970, was dubbed "the Green Revolution" (*Green Revolutionary*, John Pollock, 2007, MIT Technology Review https://www.technologyreview.com/2007/12/18/270625/green-revolutionary/)

[18] *Top scientists warn of 'ghastly future of mass extinction' and climate disruption*, *The Guardian,* 13 January, 2021 https://www.theguardian.com/environment/2021/jan/13/top-scientists-warn-of-ghastly-future-of-mass-extinction-and-climate-disruption-aoe

[19] '*Three, six or 36: how many basic plots are there in all stories ever written?',* Alison Flood, *The Guardian,* 13 July 2016 https://www.theguardian.com/books/booksblog/2016/jul/13/three-six-or-36-how-many-basic-plots-are-there-in-all-stories-ever-written

[20] Aristotle (384-322 BC), *Politics: A Treatise on Government*, Book III, Chapter XI (Translated by William Ellis, 1912) http://bit.ly/AristotlePoliticsIIIChapXI. Image: University of Michigan, Ann Arbor. www.papyri.info

[21] Pollock, John (2007) *Green Revolutionary*, MIT Technology Review https://www.technologyreview.com/2007/12/18/270625/green-revolutionary/

[22] Pollock, John (2009) *Norman Borlaug, Agronomist Who Fought World Hunger, Dies*. https://www.technologyreview.com/2009/09/15/209950/norman-borlaug-agronomist-who-fought-world-hunger-dies/

[23] Page, Scott E. (2007). *The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools, and Societies*. Princeton, NJ: Princeton University Press.

[24] Diversity scheme: https://en.wikipedia.org/wiki/Diversity_scheme

[25] 'Brian Uzzi is the Richard L. Thomas Professor of Leadership at the Kellogg School of Management, Northwestern University. He also co-directs the Northwestern Institute on Complex Systems (NICO), and holds professorships in Sociology and the McCormick School of Engineering. He has been on or visited the faculties of INSEAD, Chicago, Harvard, and Berkeley. His work has received 15 teaching prizes and 13 scientific research prizes worldwide in the social, physical, and computer sciences.' https://www.kellogg.northwestern.edu/faculty/uzzi/htm/

[26] James Crabtree (February 2010). *Let's all be friends*: New research shows how our social ties can influence us for better–and worse: making us fatter, more likely to smoke, marry, divorce and even vote. Governments should take heed. *Prospect Magazine.* https://www.prospectmagazine.co.uk/magazine/let%E2%80%99s-all-be-friends

[27] *Extra Time: 10 Lessons for an Ageing World* (May 2019, Harper Collins), Camilla Cavendish, Baroness Cavendish of Little Venice. https://en.wikipedia.org/wiki/Camilla_Cavendish,_Baroness_Cavendish_of_Little_Venice

[28] Cavendish (2019), Op.Cit.

[29] *Kydland, F and N Pretnar* (2018), "The Costs and Benefits of Caring: Aggregate Burdens of an Aging Population", NBER Working Paper 25498.

[30] In either 1993 or 1999: https://en.wikiquote.org/wiki/William_Gibson

[31] Desire paths: https://en.wikipedia.org/wiki/Desire_path

[32] 'Japan is currently the world leader, with 28 percent of its population 65 and over, triple the world average. By 2050, 29 countries and territories will have larger elder shares than Japan has today. In fact, the Republic of Korea's elder share will eventually overtake Japan's, reaching the historically unprecedented level of 38.1 percent.' David E. Bloom (March 2020, Op. Cit.)

[33] Cavendish (2019), Op. Cit. *Chapter 10, Human Revolution: Robots care for you, humans care about you*. The description of several very elderly Japanese women stroking and communicating with a robotic furry seal pup called *Paro* is both compelling and disturbing.

[34] See, for example, David E Bloom (2020, Op. Cit.) for a short summary of the demography and economics involved.

[35] A term deployed in *The New Long Life: A Framework for Flourishing in a Changing World* (May 2020) by Andrew J. Scott and Lynda Gratton

[36] *The Human Touch at Humanitas: A Rule-Bending Dutch Nursing Home Brings College Students and Seniors Together* (2019 'special feature' on global aging, exploring The Netherlands, 'a small country with big ideas on how to meet the challenges of an aging population', AARP International): https://www.aarpinternational.org/the-journal/past-editions/the-human-touch-at-humanitas

[37] 'Six university students live here with 160 elderly people aged between 79 and 100. They get rent-free accommodation in return for spending 30 hours a month with the residents: helping with chores, giving computer lessons or just making conversation. One student lives on each corridor; walking through the garden, I can tell which rooms are theirs by looking at the beer crates stacked on their balconies. The elderly residents come to life hearing about the students' exams and relationships; they especially love dissecting events the morning after, when new girlfriends are sometimes spotted trying to slip away by the fire escape.' Cavendish (2019), Op. Cit.

[38] Pollock, John (2017), *People Power 2.0: What does it mean for the military?* Presentation to the *Intermediate Command and Staff Course (Land)* at *the Joint Services Command and Staff College* in the Defence Academy

[39] WH Auden, *September 1, 1939* (1939) (the corrected line, as he regarded the original 'or die' as a falsehood).

[40] *The effect of co-morbid anxiety on remission from depression for people participating in a randomised controlled trial of the Friendship Bench intervention in Zimbabwe*, Melanie Amna Abas, Helen Anne Weissc, Victoria Simms, Ruth Verhey,Simbarashe Rusakaniko, Ricardo Araya, Dixon Chibanda (May 2020, *The Lancet*) Paper: https://www.thelancet.com/action/showPdf?pii=S2589-5370%2820%2930077-8 See also https://www.friendshipbenchzimbabwe.org for more about (and further research) this extraordinary project.

[41] Noun (archaic). 1: 'a call to arms or warning of imminent danger'…; 2: (Stage direction, especially in Elizabethan drama), 'a loud disturbance or conflict'.

[42] As I discovered a generation ago as the Department of the Environment's first social policy researcher on the environment.

[43] "At old ages, medical expenditures are around 30% higher for the unhappy than for the people claiming to be happy. Unhappy people are hospitalised more often than happy people. At any age, the proportion of people that volunteer is about 20% higher among happy people than among unhappy people." Ferranna, Maddalena (2019), *Happiness at old ages: How to promote health and reduce the societal costs of ageing*, in *Live Long & Prosper?* Ed. David E. Bloom, Op. Cit.

[44] *Pers. Comm.* (Skype, 17 January, 2021). Pontin describes himself on Twitter as the "Founding board chair of Totus Medicines, investor, and WIRED Ideas contributor" who from 2004 to 2017 was "Editor in Chief and Publisher of MIT Technology Review." www.technologyreview.com

[45] E.M. Forster, *Howards End* (1910). 'Only connect! That was the whole of her sermon. Only connect the prose and the passion, and both will be exalted, and human love will be seen at its height. Live in fragments no longer. Only connect, and the beast and the monk, robbed of the isolation that is life to either, will die.'

[46] Saint Augustine of Hippo.

[47] https://www.imdb.com/title/tt0745641/characters/nm0771493